

Serial No.: 10/790,792
Docket No.: 102-1019
Response After Final dated August 7, 2007
Reply to the Final Office Action of June 14, 2007

REMARKS

Introduction

Upon entry of the foregoing amendment, claims 1, 2, 4, and 6-27 are pending in the application. Claims 23-27 are withdrawn from consideration. No claims have been amended. No new matter is being presented. In view of the following remarks, reconsideration and allowance of all the pending claims are requested.

1. Improper finality:

The present Office Action, dated June 14, 2007 (hereinafter the "Office Action"), fails to comply with proper examination requirements contained in MPEP §706.07, which prohibits "hasty and ill-considered final rejections," and specifically states that "[t]he examiner should never lose sight of the fact that in every case the applicant is entitled to a full and fair hearing," and "in making the final rejection...any such grounds relied on...must be clearly developed to such an extent that applicant may readily judge the advisability of an appeal."

In particular, the Office Action fails to adequately consider and address all of the arguments presented by the Applicant. For example:

- It was previously pointed out to the Examiner that claim 15 depends from independent claim 10. Since claim 15 incorporates all the limitations of claim 10, and claim 10 is not rejected over Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al., a rejection of claim 15 in view of these references is improper. However, the Examiner merely repeats this improper rejection in the present Office Action without responding to the Arguments presented by the Applicant.
- Claims 7 and 15 were previously amended to overcome the §112; However, the Examiner has, again, merely repeated his prior rejection without addressing the arguments presented by the Examiner or explaining why the amended claims are still considered indefinite.
- The rejection of independent claims 1 and 16 were fully addressed by the Applicant, pointing out elements of the invention as recited in these claims that are not disclose, taught, or suggested in any of the references cited by the Examiner. However, instead

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of addressing the Applicant's arguments, the Examiner has merely, again, repeated boiler plate language about arguing against the references individually, ignoring the Applicant's argument that the Examiner has failed to point out where, if at all, all of the limitations recited in these claims are specifically taught or suggested in these references, individually or combined.

The Applicant has made a bona fide attempt to advance prosecution of this application. However, Applicant's claims and arguments have not been fully addressed by the Examiner. As such, it is clear that Applicant was denied a full and fair hearing and is therefore, unable to ascertain the advisability of an appeal. The Applicant respectfully requests that if the Examiner's rejection is maintained, a new office action is required that completely addresses all of the limitations recited within the claims, and completely addresses each and every argument forwarded by Applicant.

1. Restriction Requirement:

With respect to claims 23-27, on page 2 of the Office Action of June 14, 2007, the Examiner asserts that claims 23-27, which were added by the June 28, 2006, Amendment, "are directed to an invention that is independent or distinct from the invention originally claimed." The Applicant has repeatedly traversed this restriction requirement. See Response of March 27, 2007, December 7, 2006, and November 7, 2006. However, the Examiner has repeatedly failed to address the Applicant's arguments, and has presented no reasons why claims 23-27 are independent or distinct from claims 1-22, other than to merely paraphrase claim 23. In fact, the Examiner does not address the limitations of independent claims 25 or 27 at all, or how these claims are independent or distinct from the invention as recited in claims 1-22. In addition, the Examiner has provided no reasons why there would be a serious burden on the Examiner absent such a restriction. See MPEP §808, which requires that the Examiner provide (1) reasons for the restriction (as opposed to a summary of one of the restricted claims) and (2) reasons why there would be a serious burden without the restriction. Moreover, as described above, the Applicant has made a bona fide attempt to advance prosecution of this application. However the lack of adequate consideration of the arguments presented by the Applicant, deny the Applicant a full and fair hearing and leave the Applicant unable to ascertain the advisability

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of an appeal. Accordingly, since the Examiner has provided neither (1) nor (2), Applicant respectfully submits that the Restriction Requirement is improper, and requests that if the Examiner's rejection is maintained, a new office action is required that completely addresses all of the claims presented in this application.

Furthermore, Applicant respectfully submits that the subject matter of all of claims 1-27 is sufficiently related and that a thorough search for the subject matter of claims 1-22 would necessarily encompass a search for the subject matter of claims 23-27. Thus, it is respectfully submitted that the search and examination of the entire application could be made without serious burden. See MPEP §803, which states that: "if the search and examination of all the claims in an application can be made without serious burden, the Examiner must examine them on the merits, even though they include claims to independent or distinct inventions" (emphasis added). It is respectfully submitted that this policy should apply in the present application in order to avoid unnecessary delay and expense to Applicant and duplicative examination by the Patent Office.

2. Rejection under 35 USC §112, second paragraph:

Claims 7 and 15 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Applicant respectfully traverses this rejection for at least the following reasons.

With respect to claims 7 and 15, Applicant respectfully submits that claims 7 and 15 were previously amended for clarity. See Amendment of December 7, 2006. As amended, claims 7 and 15 are not indefinite, and are clear to one of ordinary skill in the art. In particular, as disclosed in the present specification, the forming of the preliminary ink passage 2' on the wafer 1 and the dicing of the wafer 1 using the liquid-jet guided laser results in organic materials flowing to the surfaces of the wafer 1. One of ordinary skill in the art would understand that the limitations "cleaning an organic material having flown onto the wafer" as recited in claim 7 and "cleaning an organic material having flown onto the print heads" as recited in claim 15 refer to removing the organic material that has flown to the surface of the wafer 1 during the forming of the preliminary ink passage 2' and during the dicing of the wafer 1.

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However, as described above, the Examiner has not addresses these amendments, and has not presented any reasons why these amended claims are indefinite. Accordingly, it is submitted that claims 7 and 15 satisfy all of the requirements of 35 U.S.C. §112, second paragraph, and thus, reconsideration and withdrawal of this rejection are respectfully requested.

3. Rejection under 35 USC §103(a): Richerzhagen, Yamamoto et al., Merdan et al., and Peng et al.:

Claims 1-2, 4, 6-7, 9, and 15-22 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,902,499 to Richerzhagen in view of U.S. Patent No. 5,482,660 to Yamamoto et al., U.S. Patent No. 6,696,666 to Merdan et al. and U.S. Patent No. 6,737,606 to Peng et al. The Applicant respectfully traverses this rejection for at least the following reasons.

a. Claim 1:

With respect to independent claim 1, on pages 3-4 of the Office Action, the Examiner alleges that the combination of Richerzhagen, Yamamoto et al., Merdan et al., and Peng et al. disclose or teach all of the limitations of the invention as recited in claim 1. In particular, the Examiner alleges that:

[i]t would have been obvious... ..to use a stage and wafer, as taught by Yamamoto et al. in the Richerzhagen process because the state enhance versatility during fabrication and the use of a wafer is merely a design choice, [i]t would have been obvious.....to use different type of lasers as taught by Merdan et al. because this is drawn to the same liquid jet guided laser, [and] [it] would have been obvious... ..to note the diameter as taught by Peng et al. because these parameters are based on the same liquid jet guided laser.

However, Applicant respectfully submits that these references do not disclose or teach the Applicant's invention as recited in claim 1, either individually or combined. That is, the Examiner has failed to establish a *prima facie* case of obviousness for claim 1, because the references cited, either individually or combined, do not teach or disclose all of the limitations of the invention as recited in claim 1.

Contrary to the Examiner's allegation that the Applicant is arguing against the references individually, when the rejections are based on combinations, the Applicant respectfully submit

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that: 1) Richerzhagen does not disclose or teach the limitations of claim 1 as alleged by the Examiner; 2) Yamamoto et al. also does not teach the limitations of claim 1 as alleged by the Examiner, nor does Yamamoto et al. teach or suggest the limitations of claim 1 lacking from Richerzhagen; 3) Merdan et al. also does not teach the limitations of claim 1 as alleged by the Examiner, nor does Merdan et al. teach or suggest the limitations of claim 1 lacking from Richerzhagen and/or Yamamoto et al.; and, 4) Peng et al. does not disclose, teach, or suggest, any of the limitations that are lacking from Richerzhagen, Yamamoto et al., and Merdan et al. Accordingly, since all of the limitations of the invention recited in claim 1 are not disclosed, taught, or suggest by these references, either individually or combined, claim 1 is allowable over Richerzhagen, Yamamoto et al., Merdan et al., and Peng et al., either individually or combined, and withdrawal of this rejection and allowance of this claim is respectfully requested.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

- 1) Richerzhagen does not disclose the limitations of claim 1 as alleged by the Examiner.

With respect to Richerzhagen, while the Examiner admits that "Richerzhagen does not teach the presence of a wafer, or a stage or all types of lasers or the laser beam diameter," see Office Action, page 3, the Examiner does not point out where any of the limitations of claim 1 are disclosed in Richerzhagen. Instead the Examiner simply states that "Richerzhagen discloses a laser and liquid jet for material machining." That is, the Examiner fails, again, to point out where the particular limitations recited in claim 1 are disclosed, if at all, in Richerzhagen. Such a blanket type coverage rejection does not provide Applicant with an opportunity to respond to the Examiner's assertions as to whether any of the claimed features or process operations are the same or different from the cited reference. Therefore, the Applicant can only attempt to respond

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to this rejection in view of what can only be assumed to be what the Examiner is referring to.

Richerzhagen describes an arrangement to couple a laser beam with a fluid jet for material processing, focusing on preventing damage to the fluid jet nozzle by laser radiation. See Richerzhagen, Col. 1, lines 62-67. That is, while Richerzhagen describes that laser irradiation is used for "material processing," including cutting, drilling, welding, marking, and material stripping, see Richerzhagen, Col. 1, lines 10-14, Richerzhagen does not disclose, teach or suggest any specific material processed or any specific processing to form a desired feature on a material. Accordingly, the Applicant respectfully submits that Richerzhagen does not teach or suggest any of the features recited in claim 1. That is, among other things, Richerzhagen does not teach or suggest Applicant's "process of forming an ink feeding port through a wafer which constitutes an ink-jet print head," "fixing the wafer to a stage in a chamber to perform the process," "processing the ink feeding port in the wafer to a desired depth using a liquid-jet guided laser," and "moving the stage, on which the wafer is fixed, along an ink feeding port pattern," as recited in claim 1.

- 2) Yamamoto et al. does not disclose the limitations of claim 1 as alleged by the Examiner, nor does it disclose or suggest the limitations lacking in Richerzhagen.

With respect to Yamamoto et al., while the Examiner alleges that it discloses "the fabrication of an ink jet," see Office Action, page 3, the Examiner does not point out where any of the limitations of claim 1 are disclosed in Yamamoto et al. That is, the Examiner fails, again, to point out where the particular limitations recited in claim 1 are disclosed, if at all, in Yamamoto et al. Accordingly, the Applicant can only attempt to respond to this rejection in view of what can only be assumed to be what the Examiner is referring to. However, it is respectfully submitted that Yamamoto et al. also does not teach or suggest all of the limitations as recited in claim 1, and does not cure the deficiencies of Richerzhagen.

Yamamoto et al. describes a method to fabricate an ink jet recording head with a water-repellent discharge port face. See Yamamoto et al., Col. 3, lines 44-48. Yamamoto et al. describes the formation of a supply port 10, an ink liquid chamber 9, and ink liquid channels 8 on a ceiling plate through injection molding. See Yamamoto et al., Col. 6, lines 19-24. This is

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not the same as “wherein: the ink feeding port forming process comprises: fixing the wafer to a stage in a chamber to perform the process, and processing the ink feeding port in the wafer to a desired depth using a liquid-jet guided laser,” as recited in claim 1.

Furthermore, Yamamoto et al. describes the use of an excimer laser to form ink discharge ports 7 after the other structures, listed above, have been formed by injection molding. See Yamamoto et al., Col. 6, lines 33-36. That is, Yamamoto describes the use of an excimer laser, which is not the same as “a liquid-jet guided laser,” as recited in claim 1, to form a discharge port 7, which is also not the same as “the ink feeding port,” as recited in claim 1. Accordingly, neither Richerzhagen nor Yamamoto et al., individually or combined, disclose, teach, or suggest, among other things “wherein the ink feeding port forming process comprises: fixing the wafer to a stage in a chamber to perform the process, and processing the ink feeding port in the wafer to a desired depth using a liquid-jet guided laser,” and “the operation of processing the ink feeding port comprises: illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser,” as recited in claim 1.

Instead, the Examiner appears to offer its own hypothesis for expanding the nature of elements of these references, and combining them in ways not present, inherently required, or suggested by any of these references to allege they correspond to the limitations recited in claim 1. Not only does the Examiner not specifically point out which structures in Richerzhagen or Yamamoto et al. correspond to the limitations of claim 1, but at best, the Examiner seems to be arguing for impermissible hindsight.

When applying 35 U.S.C. 103, the following tenets of patent law must be adhered to:

- (A) The claimed invention must be considered as a whole;
- (B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;
- (C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention; and
- (D) Reasonable expectation of success is the standard with which obviousness is determined.

Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986). (Emphasis added).

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- 3) Merdan et al. fails to disclose the limitations of claim 1 lacking in Richerzhagen and Yamamoto et al.

With respect to Merdan et al., the Examiner alleges that Merdan et al. "discloses the use of hybrid laser water systems (laser micro-jet)," that "[t]ypes of lasers suitable for use with this system are YAG lasers, IR lasers, CO2 lasers, diode lasers, and any combination thereof," and that "it would have been obvious...to use different type of lasers as taught by Merdan et al. because this is drawn to the same liquid jet guided laser." However, the Applicant respectfully submits that Merdan et al. does not disclose, teach, or suggest the limitations that are lacking from both Richerzhagen and Yamamoto et al., and that none of the references cited by the Examiner, individually or combined, disclose, teach, or suggest, all of the limitations recited in claim 1.

Merdan et al. describes a system to cut and process a hollow tube. See Merdan et al., abstract. That is, Merdan et al. describes the processing of hollow tubular members, suitable for implantation into the human body lumen and coated with lubricants or drug vectors, using a laser. See Merdan et al., Col. 4, lines 16+, Col. 5, 1-27. Further, Merdan et al. limits the types of lasers it system uses to lasers "suitable for use in processing tubular members," see Merdan et al., Col. 5, lines 32-34, and uses a fluid column flowing through the inside of the hollow tubular member to prevent the laser used from impacting an interior surface of the tubular member as it's being processed. See Merdan et al., Col. 5, lines 37-47. That is, Merdan et al. describes that a YAG laser, an IR laser, A UV laser, a CO2 laser, a diode laser, or a combination thereof, may be used to process hollow tubes while using a water column flowing through the tube to disrupt the laser energy and prevent the laser from impacting the interior surface of the tube. Accordingly, as described above, neither Richerzhagen, Yamamoto et al. nor Merdan et al. teach or suggest, among other things, "wherein the ink feeding port forming process comprises: fixing the wafer to a stage in a chamber to perform the process, and processing the ink feeding port in the wafer to a desired depth using a liquid-jet guided laser," and "the operation of processing the ink feeding port comprises: illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser," as recited in claim 1.

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Furthermore, it is respectfully submitted that Merdan et al. cannot be used to form an obviousness type rejection because it is not analogous art. To be analogous prior art, Merdan et al. must either be in the field of the claimed invention, or must be reasonably pertinent to the problem with which the claimed invention is concerned. See In re Oetiker, 977 F.2d 1443 and MPEP §2141.01(a). However, it is respectfully submitted that Merdan et al. is not in the same field as the Applicant's inventions and it is also not pertinent to the problem addressed by the Applicant's invention.

Merdan et al. describes the formation of stents, that is, of hollow tubular medical devices that are usually coated with drugs and inserted into the human body. See Merdan et al., Col. 15-23. That is, Merdan et al. has nothing to do with the fabrication of ink-jet print heads, and therefore is not in the same field of art as the Applicant's invention. Furthermore, Merdan et al. is limited to describing the processing of hollow tubes using a laser, and using a fluid column flowing through the hollow tube to disrupt the laser energy and prevent the laser from impacting an interior surface of the hollow tube. See Merdan et al., Col. 5, lines 32-34, and 37-47. That is, Merdan et al. is not pertinent to the problem of forming an ink feeding port through a wafer which constitutes an ink jet print head as addressed by the Applicant's invention.

Accordingly, Merdan et al. is not analogous art with respect to the Applicant's invention, and therefore cannot be used in combination with Richerzhagen, Yamamoto et al., or Peng et al. to form an obviousness type rejection. Thus, the rejection of claim 1 in view of Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al. is left unsupported, and withdrawal of this rejection and allowance of this claim is respectfully requested.

- 4) Peng et al. fails to disclose the limitations of claim 1 lacking in Richerzhagen, Yamamoto et al., and Merdan et al.

With respect to Peng et al., the Examiner cites Peng et al. merely to allege that it "discloses the use of laser beam liquid assembly for the dicing of wafers", and that "[t]he liquid stream has a diameter equal to the laser beam diameter, which is about 50 to 150 μm ." However, Peng et al. does not disclose, teach, or suggest, all of the limitations present in claim 1 lacking in the cited references. For Example, Peng et al. does not disclose, teach, or suggest, among other things "wherein the ink feeding port forming process comprises: fixing the wafer to

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a stage in a chamber to perform the process, and processing the ink feeding port in the wafer to a desired depth using a liquid-jet guided laser,” and “the operation of processing the ink feeding port comprises: illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser,” as recited in claim 1.

Accordingly, neither Richerzhagen, Yamamoto et al., Merdan et al., or Peng et al., either individually or combined, disclose, teach, or suggest, among other things “wherein the ink feeding port forming process comprises: fixing the wafer to a stage in a chamber to perform the process, and processing the ink feeding port in the wafer to a desired depth using a liquid-jet guided laser,” and “the operation of processing the ink feeding port comprises: illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser,” as recited in claim 1. That is, the Examiner has failed to establish a *prima facie* case of obviousness for claim 1, because the references cited, either individually or combined, do not teach or disclose all of the limitations of the invention as recited in claim 1. Thus, since Richerzhagen, Yamamoto et al., Merdan et al., or Peng et al., either individually or combined, do not disclose, teach, or suggest all of the limitation of the invention as recited in claim 1, claim 1 is allowable over all of these references, and withdrawal of this rejection and allowance of this claim is respectfully requested.

b. Claims 2, 4, 6-7, and 9:

With respect to claims 2, 4, 6-7, and 9, it is respectfully submitted that for at least the reason that these claims depend from independent claim 1, which is allowable for at least the reasons provided above, and therefore contain each of the features as recited in claim 1, dependent claims 2, 4, 6-7, and 9 are also allowable over Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al., either individually or combined.

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c. Claim 15:

With respect to claim 15, it is respectfully pointed out that claim 15 depends from independent claim 10, which is not rejected over Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al. Accordingly, since claim 15 incorporates all the limitations of claim 10, and claim 10 is patentable over these references (since it is not rejected in view of Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al., dependent claim 15 is also allowable over these references either individually or combined.

d. Claim 16:

With respect to independent claim 16, on pages 3-4 of the Office Action, the Examiner appears to reject claim 16 for the same reasons as presented to reject independent claim 1. That is, as described above with respect to claim 1, insofar as the Examiner fails to point out where, if at all, the limitations recited in claims 1 and 16 are disclosed or taught in Richerzhagen and/or Yamamoto et al., but instead merely alleges that these references disclose the invention recited in claims 1 and 16 in general terms, the Applicant respectfully submits that these references also do not disclose the Applicant's invention as recited in claim 16, either individually or combined, for similar reasons as described above with respect to claim 1. That is, the Examiner has also failed to establish a *prima facie* case of obviousness for claim 16, because the references cited, either individually or combined, do not teach or disclose all of the limitations of the invention as recited in claim 16.

Contrary to the Examiner's allegation that the Applicant is arguing against the references individually, when the rejections are based on combinations, the Applicant respectfully submit that: 1) Richerzhagen does not disclose or teach the limitations of claim 16 as alleged by the Examiner; 2) Yamamoto et al. also does not teach the limitations of claim 16 as alleged by the Examiner, nor does Yamamoto et al. teach or suggest the limitations of claim 16 lacking from Richerzhagen; 3) Merdan et al. also does not teach the limitations of claim 16 as alleged by the Examiner, nor does Merdan et al. teach or suggest the limitations of claim 16 lacking from Richerzhagen and/or Yamamoto et al.; and, 4) Peng at al. does not disclose, teach, or suggest, any of the limitations that are lacking from Richerzhagen, Yamamoto et al., and Merdan et al. Accordingly, since all of the limitations of the invention recited in claim 16 are not disclosed,

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taught, or suggest by these references, either individually or combined, claim 16 is allowable over Richerzhagen, Yamamoto et al., Merdan et al., and Peng et al., either individually or combined, and withdrawal of this rejection and allowance of this claim is respectfully requested.

That is, as described above with respect to claim 1, neither Richerzhagen, Yamamoto et al., Merdan et al., or Peng et al., either individually or combined, disclose, teach, or suggest, among other things “forming an ink-jet print head with an ink feeding port on a wafer using a liquid-jet guided laser,” and “illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser,” as recited in claim 16. That is, the Examiner has failed to establish a *prima facie* case of obviousness for claim 1, because the references cited, either individually or combined, do not teach or disclose all of the limitations of the invention as recited in claim 16. Thus, since Richerzhagen, Yamamoto et al., Merdan et al., or Peng et al., either individually or combined, do not disclose, teach, or suggest all of the limitation of the invention as recited in claim 16, claim 16 is allowable over all of these references, and withdrawal of this rejection and allowance of this claim is respectfully requested.

Furthermore, as described above, Merdan et al. is non-analogous, leaving this rejection unsupported.

e. Claims 17-22:

With respect to claims 17-22 it is respectfully submitted that for at least the reason that dependent claims 17-22 depend from independent claim 16, which is allowable for at least the reasons provided above, and therefore contain each of the features as recited in claim 16, dependent claims 17-22 are also allowable over Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al., either individually or combined.

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4. Rejection under 35 USC §103(a): Richerzhagen, Yamamoto et al., Merdan et al., Peng et al. and Hashimoto et al.:

Claims 8 and 10-14 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al. and further in view of U.S. Publication No. 2004/0246292 to Hashimoto et al. The Applicant respectfully traverses this rejection for at least the following reasons.

a. Claim 8:

With respect to claim 8, it is respectfully submitted that for at least the reason that dependent claim 8 depends from independent claim 1, which is allowable over Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al. for at least the reasons pointed out above, and therefore contains each of the features as recited in claim 1, dependent claim 8 is also allowable over these references.

Further, the Examiner cites Hashimoto et al. merely to allege it discloses "separation of a silicon wafer in the manufacturing [of a] ink jet head." See Office Action, page 5. However, for at least the reason that Hashimoto et al. does not teach any of the limitations which are lacking in Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al., Claim 8 is allowable over Richerzhagen, Yamamoto et al., Merdan et al., Peng et al., and Hashimoto et al., separately or combined, and withdrawal of this rejection and allowance of this claim are respectfully requested.

b. Claim 10:

With respect to independent claim 10, on pages 4-5 of the Office Action, the Examiner appears to reject claim 10 for the same reasons as presented to reject independent claim 1, while additionally citing Hashimoto et al. to allege it discloses dicing a wafer, which the Examiner admits Richerzhagen does not teach. However, the Applicant respectfully submits that Richerzhagen, Yamamoto et al., Merdan et al., Peng et al. and Hashimoto et al., either individually or combined do not disclose the Applicant's invention as recited in claim 10, for similar reasons as described above with respect to claim 1. That is, the Examiner has also

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failed to establish a *prima facie* case of obviousness for claim 10, because the references cited, either individually or combined, do not teach or disclose all of the limitations of the invention as recited in claim 10.

As described above, contrary to the Examiner's allegation that the Applicant is arguing against the references individually, the Applicant respectfully submit that: 1) Richerzhagen does not disclose or teach the limitations of claim 10 as alleged by the Examiner; 2) Yamamoto et al. also does not teach the limitations of claim 10 as alleged by the Examiner, nor does Yamamoto et al. teach or suggest the limitations of claim 10 lacking from Richerzhagen; 3) Merdan et al. also does not teach the limitations of claim 10 as alleged by the Examiner, nor does Merdan et al. teach or suggest the limitations of claim 10 lacking from Richerzhagen and/or Yamamoto et al.; 4) Peng et al. does not disclose, teach, or suggest, any of the limitations that are lacking from Richerzhagen, Yamamoto et al., and Merdan et al.; and 5) since Hashimoto et al. is merely cited to allege it discloses dicing of a wafer, Hashimoto et al. does not teach the limitations of claim 10 lacking in Richerzhagen, Yamamoto et al., Merdan et al., and Peng et al.

Accordingly, since all of the limitations of the invention recited in claim 10 are not disclosed, taught, or suggest by these references, either individually or combined, claim 10 is allowable over Richerzhagen, Yamamoto et al., Merdan et al., Peng et al., and Hashimoto et al., either individually or combined, and withdrawal of this rejection and allowance of this claim is respectfully requested.

- 1) Richerzhagen does not disclose the limitations of claim 10 as alleged by the Examiner.

As described above, Richerzhagen describes an arrangement to couple a laser beam with a fluid jet for material processing, focusing on preventing damage to the fluid jet nozzle by laser radiation. See Richerzhagen, Col. 1, lines 62-67. That is, while Richerzhagen describes that laser irradiation can be used for "material processing," including cutting, drilling, welding, marking, and material stripping, see Richerzhagen, Col. 1, lines 10-14, Richerzhagen does not disclose, teach or suggest any specific material processed or any specific processing to form a desired feature on a material. Accordingly, the Applicant respectfully submits that Richerzhagen does not teach or suggest any of the features recited in claim 10, and among

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other things, Richerzhagen does not teach or suggest “a dicing process of dicing a wafer formed with a plurality of print heads using a liquid-jet guided laser, wherein: the dicing process comprises: fixing the wafer to a stage of a chamber, and dicing the wafer using the liquid-jet guided laser,” and “illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser, and moving the stage, on which the wafer is fixed, along a dicing pattern; and the laser beam comprises one of a diode-pumped solid laser beam and a gas laser beam,” as recited in claim 10.

- 2) Yamamoto et al. does not disclose the limitations of claim 10 as alleged by the Examiner, nor does it disclose or suggest the limitations lacking in Richerzhagen.

As described above, Yamamoto describes the use of an excimer laser, which is not the same as “a liquid-jet guided laser,” as recited in claim 10. Accordingly, neither Richerzhagen nor Yamamoto et al., individually or combined, disclose, teach, or suggest, among other things “a dicing process of dicing a wafer formed with a plurality of print heads using a liquid-jet guided laser, wherein: the dicing process comprises: fixing the wafer to a stage of a chamber, and dicing the wafer using the liquid-jet guided laser,” and “illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser, and moving the stage, on which the wafer is fixed, along a dicing pattern; and the laser beam comprises one of a diode-pumped solid laser beam and a gas laser beam,” as recited in claim 10.

- 3) Merdan et al. fails to disclose the limitations of claim 1 lacking in Richerzhagen and Yamamoto et al.

Also as described above, Merdan et al. describes the processing of hollow tubular members, suitable for implantation into the human body lumen and coated with lubricants or drug vectors, using a laser. See Merdan et al., Col. 4, lines 16+, Col. 5, 1-27. Further, Merdan et al. limits the types of lasers it system uses to lasers “suitable for use in processing tubular members,” see Merdan et al., Col. 5, lines 32-34, and uses a fluid column flowing through the inside of the hollow tubular member to prevent the laser used from impacting an interior surface of the tubular member as it's being processed. See Merdan et al., Col. 5, lines 37-47. That is,

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Merdan et al. describes that a YAG laser, an IR laser, A UV laser, a CO2 laser, a diode laser, or a combination thereof, may be used to process hollow tubes while using a water column flowing through the tube to disrupt the laser energy and prevent the laser from impacting the interior surface of the tube. Accordingly, neither Richerzhagen, Yamamoto et al. nor Merdan et al. teach or suggest, among other things, "a dicing process of dicing a wafer formed with a plurality of print heads using a liquid-jet guided laser, wherein: the dicing process comprises: fixing the wafer to a stage of a chamber, and dicing the wafer using the liquid-jet guided laser," and "illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser, and moving the stage, on which the wafer is fixed, along a dicing pattern; and the laser beam comprises one of a diode-pumped solid laser beam and a gas laser beam," as recited in claim 10.

Furthermore, Merdan et al. cannot be used to form an obviousness type rejection because it is not analogous art. Merdan et al. describes the formation of medical stents. See Merdan et al., Col. 15-23. That is, Merdan et al. has nothing to do with the fabrication of ink-jet print heads, and therefore is not in the same field of art as the Applicant's invention. Additionally, Merdan et al. is limited to describing the processing of hollow tubes using a laser, and using a fluid column flowing through the hollow tube to disrupt the laser energy and prevent the laser from impacting an interior surface of the hollow tube. See Merdan et al., Col. 5, lines 32-34, and 37-47. That is, Merdan et al. is not pertinent to the problem of forming an ink feeding port through a wafer which constitutes an ink jet print head as addressed by the Applicant's invention.

- 4) Peng et al. fails to disclose the limitations of claim 1 lacking in Richerzhagen, Yamamoto et al., and Merdan et al.

With respect to Peng et al., as described above, the Examiner cites Peng et al. merely to allege that it "discloses the use of laser beam liquid assembly for the dicing of wafers", and that "[t]he liquid stream has a diameter equal to the laser beam diameter, which is about 50 to 150 μm ." Accordingly, neither Richerzhagen, Yamamoto et al., Merdan et al., and Peng et al. teach or suggest, among other things, "a dicing process of dicing a wafer formed with a plurality of

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print heads using a liquid-jet guided laser, wherein: the dicing process comprises: fixing the wafer to a stage of a chamber, and dicing the wafer using the liquid-jet guided laser,” and “illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser, and moving the stage, on which the wafer is fixed, along a dicing pattern; and the laser beam comprises one of a diode-pumped solid laser beam and a gas laser beam,” as recited in claim 10.

- 5) Peng et al. fails to disclose the limitations of claim 1 lacking in Richerzhagen, Yamamoto et al., and Merdan et al.

Further, the Examiner cites Hashimoto et al. merely to allege it discloses “separation of a silicon wafer in the manufacturing [of a] ink jet head.” See Office Action, page 5. However, for at least the reason that Hashimoto et al. does not teach any of the limitations which are lacking in Richerzhagen, Yamamoto et al., Merdan et al. and Peng et al., Claim 10 is allowable over Richerzhagen, Yamamoto et al., Merdan et al., Peng et al., and Hashimoto et al., separately or combined.

Accordingly, neither Richerzhagen, Yamamoto et al., Merdan et al., Peng et al., or Hashimoto et al., either individually or combined, disclose, teach, or suggest, among other things “a dicing process of dicing a wafer formed with a plurality of print heads using a liquid-jet guided laser, wherein: the dicing process comprises: fixing the wafer to a stage of a chamber, and dicing the wafer using the liquid-jet guided laser,” and “illuminating a laser beam guided by a liquid-jet having a diameter in the range of 10 to 500 μm through the liquid-jet guided laser, and moving the stage, on which the wafer is fixed, along a dicing pattern; and the laser beam comprises one of a diode-pumped solid laser beam and a gas laser beam,” as recited in claim 10. That is, the Examiner has failed to establish a *prima facie* case of obviousness for claim 10, because the references cited, either individually or combined, do not teach or disclose all of the limitations of the invention as recited in claim 10. Thus, since Richerzhagen, Yamamoto et al., Merdan et al., or Peng et al., either individually or combined, do not disclose, teach, or suggest all of the limitation of the invention as recited in claim 10, claim 10 is allowable over all of these references, and withdrawal of this rejection and allowance of this claim is respectfully requested.

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c. Claims 11-14:

With respect to claims 11-14 it is respectfully submitted that for at least the reason that dependent claims 11-14 depend from independent claim 10, which is allowable for at least the reasons provided above, and therefore contain each of the features as recited in claim 16, dependent claims 11-14 are also allowable over Richerzhagen, Yamamoto et al., Merdan et al., Peng et al., and Hashimoto et al., either individually or combined.

Conclusion

It is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, there being no other objections or rejections, this application is in condition for allowance, and a notice to this effect is earnestly solicited.

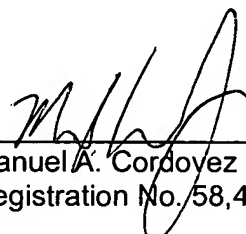
If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided below.

If any further fees are required in connection with the filing of this amendment, please charge the same to our Deposit Account No. 502827.

Respectfully submitted,

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